

Please amend claim 5 as follows:

--5. (amended) Ophthalmic lens device according to claim 4, wherein the material comprises at least one polymer onto which is bonded at least one substituent selected from the group consisting of sulfur, halogens and aromatic nuclei.--

B₂ (Please amend claim 6 as follows:)

--6. (amended) Ophthalmic lens device according to claim 4, wherein the material comprises at least one polymer onto which is bonded at least one substituent selected from the group consisting of chlorine, bromine and iodine.--

R E M A R K S

The duplicate of the drawing originally filed is attached hereto, with a copy of the receipt card proving its original filing.

Claim rejections - 35 USC § 112

Claim 5 has been amended in order to particularly point out and distinctly claim the subject matter which is regarded as the invention.

The dependency of claims 5 and 6 from claim 4 has now been clarified.

Claim rejections - 35 USC § 102

Claims 3, 4, 7, 12-14 and 17-18 are rejected under 35 USC § 102 as being anticipated by SMITH (U.S. patent 4,842,601).

Before considering SMITH, it appears necessary to explain the relationship between the optical power and the refractive index of an optical lens.

The position and size of images shown by an optical lens are determined by its image focal distance f' and its object focal distance f .

The f and f' values are dependent upon the refractive index of the lens and that of the external medium surrounding the lens, on the lens thickness and on the curvature radii of both sides of the lens.

The image focal distance is positive for convergent lenses and negative for divergent lenses.

The image focal distance of an optical lens which are used to replace the natural crystalline lens of the human eye, having a refractive index n and which sides are segments of spheres having respective radii R_1 and R_2 can be calculated as follows, according to the formula used by spectacle manufacturers:

$$1/f = (n - n_0)(1/R_1 - 1/R_2)$$

In this formula:

- f is the image focal distance expressed in meters,
- n is the refractive index of the lens constituent material,

- n_0 is the refractive index of the external medium (where the medium on both sides of the lens has the same refractive index n_0),

- R_1 and R_2 are the curvature radii of the segments of spheres of the lens, expressed in meters.

The power of the lens (P) is expressed in diopters and is defined as the inverse of the image focal distance f :

$$P = 1/f$$

P is positive for convergent lenses and negative for divergent lenses.

SMITH states that "the muscle-acting zonules that nature has provided and which also are left within the eye so that they can exert a tensional pull on the natural capsule with the consequence that an artificial lens can be flattened so as to change the refractive index thereof" (col. 1, l. 65-69).

It is correct that the muscle-acting zonules can "exert a tensional pull on the natural capsule" and thus that an artificial lens may be flattened under the action of such constraint.

However, it is clear for a person skilled in the art that this flattening does not cause any variation of the refractive index and that the words "refractive index" are totally inappropriate.

According to the above formula, it is clear for the person skilled in the art that the power of a lens located in a

medium having a refractive index n_0 depends on two independent factors, namely:

- the constituent material of the lens, and
- the curvature radii R_1 and R_2 of the two lens sides.

Therefore, when it is desired to modify the power of a lens, it is necessary to act upon one of these factors.

According to SMITH, the tensional pull flattens the artificial lens, i.e. it modifies the curvature of the lens.

In this case, the variation of power is at best due to a modification of the curvature radii whereas the refractive index remains unchanged.

In this case, the geometry of the lens remains unchanged and the modification of the lens power is due to the modification of the refractive index.

The effect of the action of zonules on the lens according to SMITH in comparison to the lens according to the invention is shown on Annex 1.

Claims 3, 4, 8-14 and 17-18 are rejected under 35 USC § 102(b) as being anticipated by SCHACHAR patent no. 4,373,218 (hereinafter referred to as "SCHACHAR '218").

Claim 3 has been amended to recite that the force is being directly exerted on the material by ocular tissue, for causing the refractive index to change, thereby clearly distinguishing over SCHACHAR '218 as acknowledged by the Examiner.

Claim rejections - 35 USC § 103

Claims 15-16 are rejected under 35 USC § 103(a) as being unpatentable over SMITH.

As noted above, SMITH teaches that the ocular muscle exerts an action on the lens which would at best result in a change of the optical power of the lens, but not into a change of the refractive index.

In view of the present amendment and the foregoing remarks, it is believed that this application has been placed in condition for allowance.

In the event that there are any question relating to this amendment, it would be appreciated if the Examiner would telephone the undersigned attorney.

The undersigned has been authorized to conduct an interview with the Examiner who has charge of this application. On the one hand, we do not wish to waste the Examiner's time and the client's money on an interview, if, as we believe, the application is hereby placed in condition for allowance.

On the other hand, if for any reason the Examiner cannot now allow the application, he is respectfully requested to call the undersigned for the purpose of arranging such an interview.

FEURER et al. 09/647,546

Attached hereto is a marked-up version of the changes made to the specification and claims. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

Respectfully submitted,

YOUNG & THOMPSON



Robert J. Patch, Reg. No. 17,355
745 South 23rd Street
Arlington, VA 22202
Telephone (703) 521-2297

RJP/psf
Attachments
December 27, 2002

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claim 3 has been amended as follows:

--3. (amended) An ophthalmic lens device comprising a material having an optical refractive index varying in at least one direction in response to a force being exerted directly on the material by [an] ocular tissue, for causing the refractive index to change.--

Claim 5 has been amended as follows:

--5. (amended) Ophthalmic lens device according to claim 4, wherein the [polymer is substituted by] material comprises at least one polymer onto which is bonded at least one substituent selected from the group consisting of sulfur, halogens and aromatic nuclei.--

Claim 6 has been amended as follows:

--6. (amended) Ophthalmic lens device according to claim 4, wherein the material comprises at least one polymer onto which is bonded [said polymer is substituted by] at least one substituent selected from the group consisting of chlorine, bromine and iodine.--